FULTON COUNTY PURCHASING DEPARTMENT

Winner 2000 - 2004 Achievement of Excellence in Procurement Award
National Association of Purchasing Management

Jerome Noble, Director

FULTON COUNTY

August 4, 2005

RE: **#05ITB45133K-RS**
Fairburn Neighborhood Senior Center

Dear Bidders:

Attached is one (1) copy of Addendum 1, hereby made a part of the above referenced Invitation to Bid (ITB).

Except as provided herein, all terms and conditions in the ITB referenced above remain unchanged and in full force and effect.

Sincerely,

Rholanda M. Stanberry

Rholanda Malveaux Stanberry
Chief Assistant Purchasing Agent

This Addendum forms a part of the contract documents and **modifies** the original ITB documents as noted below:

ACKNOWLEDGEMENT OF ADDENDUM NO. 1

The undersigned bidder acknowledges receipt of this addendum by returning one (1) copy of this form with the proposal package to the Purchasing Department, Fulton County Public Safety Building, 130 Peachtree Street, Suite 1168, Atlanta, Georgia 30335 by the ITB due date and time **Wednesday, August 17, 2005 no later than 11:00 A.M.**

This is to acknowledge receipt of Addendum No. 1, _____ day of _____, 2005.

_____
Legal Name of Bidder

_____
Signature of Authorized Representative

_____
Title

ADDENDUM NUMBER ONE

Item 1 Bid Due Time and date for last Request for Information has been changed:

1. Bid Due Date will be 11:00 A.M. August 17, 2005
2. Last date/time for submitting RFIs is by 5:00 P.M. August 10, 2005

Item 2 Clarify Sewer Work

1. Re-issue drawing C10.0 Sewer Extension Plan with clarification to the scope of work under this bid/contract

Item 3 Drawing C1.1 Survey

1. Issue drawing C1.1 which was omitted from the original bid drawings

Note: drawings for Item 2 and Item 3 are available at Imaging Technologies and at the plan rooms listed in the Bid Manual.

Item 4 Tap fees

1. Reference Specification section 01 010 Summary of Work, item 3. Regulatory Requirements & Standards for Contractor responsibility for water & sewer tap fees. Contac Troy Besseche 770-969-3481 (ext 302) or Chip Flowers (770) 969-3482 of the City of Fairburn regarding water meter & sewer tap costs.

Item 5 Door Schedule

1. Issue specification section 08 720 Door Schedule dated Rev. 1 July 29, 2005 (5 pgs.)

Item 6 Horizontal Louver Blinds

1. Issue specification section 12 491 Horizontal Louver Blinds dated Rev. 1 July 29, 2005 (2 pgs.)

Item 7 Roller Shades

1. Issue specification section 12 494 Roller Shades dated Rev. 1 July 29, 2005 (8 pgs.)

Item 8 Table of Contents

1. Delete Section 15 955 Mechanical Commissioning Requirements
2. Add Section 15 995 Mechanical Commissioning Requirements (note: this section has been included in the specification manual issued).
3. Delete Section 08 900Miscellaneous Glass & Glazing (note: this section is not used)

Item 9 Mechanical

1. Re-issue specification section 15 010 Mechanical General dated Rev. 1 July 29, 2005 (12 pgs.)

Item 10 Kitchen Equipment

1. Section 11400-8, Part 2 Products, sub-paragraph 2.3 Equipment Schedule, Item No. 4, Ice Maker, add the following:
   b3. Bin, Model No. Q-420

2. Section 11400-12, Part 2 Products, sub-paragraph 2.3 Equipment Schedule, Item No. 33, Ice Maker, delete and replace with “Number Not Used”

End Addendum No. 1

Door Number **Room Name:** Walking Track

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
1-C1	A	C	3'-0"(PR)	7'-0"	ALUM	ANOD			ALUM			ANOD	1	

Remarks: Weatherstripping, Alarm Contact, Aluminum Threshold

Door Number **Room Name:** Walking Track

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
1-C1	B	C	3'-0"(PR)	7'-0"	ALUM	ANOD			ALUM			ANOD	1	

Remarks: Weatherstripping, Alarm Contact, Aluminum Threshold

Door Number **Room Name:** Service Corridor

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
1-C2	A	A	3'-0"	7'-0"	WD	STN		5A	HM	1	2	PNT	2	

Remarks: Kickplates

Door Number **Room Name:** Service Corridor

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
1-C2	B	A	3'-6"	7'-0"	MTL	PNT		20B	HM	3	4	PNT	3	

Remarks: Weatherstripping, Alarm Contact, Aluminum Threshold, View Port

Door Number **Room Name:** Service Corridor

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
1-C3	A	B	3'-6"	7'-0"	MTL	PNT		5A	HM	1	2	PNT	3	

Remarks: Kickplates

Door Number **Room Name:** Vestibule

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
101	A	D	3'-0"(PR)	7'-0"	ALUM	ANOD			ALUM			ANOD	4	

Remarks: Bi-parting Aluminum Entrance Doors With Breakaway Side Lites, Transom, Motion Detector, Aluminum Threshold

Door Number **Room Name:** Vestibule 1-101

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
101	B	D	3'-0"	7'-0"	ALUM	ANOD			ALUM			ANOD	5	

Remarks: Bi-parting Aluminum Entrance Doors With Breakaway Side Lites, Transom, Motion Detector, Aluminum Threshold

Door Number **Room Name:** Closet

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
102	A	A	3'-0"	7'-0"	WD	STN		5A	HM	5	6	PNT	6	

Remarks: Pocket Door And Frame, Floor Mounted Door Stop

Door Number		Room Name: Closet												
		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
103	A	A	3'-0"	7'-0"	WD	STN		5A	HM	5	6	PNT	6	
		Remarks: Hold Open Devices												

Door Number		Room Name: Lobby/ Gallery												
		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
104	A	A	3'-0"(PR)	7'-0"	WD	STN		6A	HM	1	2	PNT	7	
		Remarks: Hold Open Devices												

Door Number		Room Name: Lobby/ Gallery												
		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
104	B	A	3'-0"(PR)	7'-0"	WD	STN		5D	HM	7	2	PNT	8	
		Remarks: Hold Open Devices, Wood Infill Transom Panels												

Door Number		Room Name: Lobby/ Gallery												
		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
104	C	A	3'-0"(PR)	7'-0"	WD	STN		5D	HM	7	2	PNT	8	
		Remarks: Hold Open Devices, Wood Infill Transom Panels												

Door Number		Room Name: Women Toilet												
		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
105	A	A	3'-0"	7'-0"	WD	STN		5A	HM	1	2	PNT	9	
		Remarks: Mop Plates, Undercut 1/2”, Marble Threshold												

Door Number		Room Name: Janitor												
		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
106	A	A	3'-0"	7'-0"	WD	STN		5A	HM	1	2	PNT	10	
		Remarks: Mop Plates, Undercut 1/2”, Marble Threshold												

Door Number		Room Name: Men Toilet												
		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
107	A	A	3'-0"	7'-0"	WD	STN		5A	HM	1	2	PNT	9	
		Remarks: Mop Plates, Undercut 1/2”, Marble Threshold												

Door Number		Room Name: Arts And Crafts												
		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
108	A	B	3'-0"	7'-0"	WD	STN		6A	HM	1	2	PNT	11	
		Remarks:												

Door Number **Room Name:** Computer Room

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
109	A	B	3'-0"	7'-0"	WD	STN		6A	HM	1	2	PNT	11	

Remarks:

Door Number **Room Name:** Exercise

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
110	A	B	3'-0"	7'-0"	WD	STN		6A	HM	1	2	PNT	11	

Remarks:

Door Number **Room Name:** Storage

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
111	A	A	3'-0"	7'-0"	WD	STN		5A	HM	1	2	PNT	12	

Remarks:

Door Number **Room Name:** Kiln

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
112	A	A	3'-0"	7'-0"	WD	STN		5A	HM	1	2	PNT	12	

Remarks:

Door Number **Room Name:** Storage

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
113	A	A	3'-0"(PR)	7'-0"	MTL	PNT		5A	HM	1	2	PNT	12	

Remarks:

Door Number **Room Name:** Quilting

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
114	A	B	3'-0"	7'-0"	WD	STN		6A	HM	1	2	PNT	11	

Remarks:

Door Number **Room Name:** Game Room

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
115	A	B	3'-0"	7'-0"	WD	STN		6A	HM	1	2	PNT	11	

Remarks:

Door Number **Room Name:** Multipurpose Room

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
116	A	C	3'-0"	7'-0"	ALUM	ANOD			ALUM			ANOD	13	

Remarks: Weatherstripping, Aluminum Threshold, Alarm Contact

Door Number **Room Name:** Multipurpose Room

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
116	B	C	3'-0"(PR)	7'-0"	ALUM	ALUM			ALUM			ANOD	14	

Remarks: Weatherstripping, Aluminum Threshold, Alarm Contact

Door Number **Room Name:** Multipurpose Room

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
116	C	C	3'-0"	7'-0"	ALUM	ANOD			ALUM			ANOD	13	

Remarks: Weatherstripping, Aluminum Threshold, Alarm Contact

Door Number **Room Name:** Screen Porch

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
117	A	D	3'-0"	7'-0"	WD				WD					

Remarks: Push/pull Hardware

Door Number **Room Name:** Screen Porch

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
117	B	D	3'-0"	7'-0"	WD				WD					

Remarks: Push Pull Hardware

Door Number **Room Name:** Kitchen

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
120	A	B	3'-6"	7'-0"	WD	STN		6A	HM	1	2	PNT	15	

Remarks: Kickplates

Door Number **Room Name:** Mechanical Riser

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
121	A	A	3'-0"(PR)	7'-0"	MTL	PNT		20B	HM	3	4	PNT	18	

Remarks: Keypad Lock, Aluminum Threshold, Weathersripping, Astragal

Door Number **Room Name:** Electrical Room

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
123	A	A	3'-0"(PR)	7'-0"	MTL	PNT		20B	HM	3	4	PNT	19	

Remarks: Keypad Lock, Aluminum Threshold, Weathersripping, Astragal

Door Number **Room Name:** Unisex Toilet

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
124	A	A	3'-0"	7'-0"	WD	STN		5A		1	2	PNT	16	

Remarks: Marble Threshold, Undercut 1/2", Mop Plates

Door Number **Room Name:** Unisex Toilet

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
125	A	A	3'-0"	7'-0"	WD	STN		5A	HM	1	2	PNT	16	

Remarks: Marble Threshold, Undercut 1/2”, Mop Plates

Door Number **Room Name:** Mop Sink

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
126	A	A	2'-6"	7'-0"	WD	STN		5A	HM	1	2	PNT	10	

Remarks: Marble Threshold, Undercut 1/2”, Mop Plates, Hold Open Closer

Door Number **Room Name:** Laundry

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
127	A	A	3'-0"	7'-0"	WD	STN		5A	HM	1	2	PNT	11	

Remarks: Kickplates

Door Number **Room Name:** Data

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
128	A	A	3'-0"	7'-0"	WD	STN		5A	HM	1	2	PNT	11	

Remarks: Keypad Lock, Kick Plates

Door Number **Room Name:** Lounge

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
129	A	A	3'-0"	7'-0"	WD	STN		5C	HM	1	2	PNT	11	

Remarks: Sidelite

Door Number **Room Name:** Quiet Room

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
130	A	A	3'-0"	7'-0"	WD	STN		5A	HM	1	2	PNT	11	

Remarks:

Door Number **Room Name:** Office

		Doors						Frames						
		Type	Width	Height	Material	Finish	Label	Fr.type	Fr. Mat.	Head	Jamb	Finish	Hdwr Set	Fire Rating
131	A	A	3'-0"	7'-0"	WD	STN		5A	HM	1	2	PNT	11	

Remarks:

SECTION 12491

HORIZONTAL LOUVER BLINDS

PART 1 - GENERAL

1.1 SUMMARY

A. Related sections:

1. Section 09260: Gypsum Board Assemblies.

1.2 SUBMITTALS

A. Product data: Manufacturer's catalog cuts for blinds. Indicate materials, finishes, construction, and installation instructions.

B. Shop drawings: Complete indicating window configurations, sloped heads, and accessibility to tilt mechanism, clearances, and requirements for installation in each opening type.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Horizontal aluminum slat venetian blinds:

1. Acceptable products:

a. Hunter Douglas, Inc.; Contract Micro 5/8" Aluminum Blinds Model CM82.
b. Levelor Lorentzen, Inc.; Riveria Micro DustGuard Blind.
c. Springs Window Fashions Divisions, Inc.; Bali Micro Blind Series S4000.

2. Characteristics:

a. Furnish each blind as complete unit produced by one manufacturer; include hardware, accessory items, mounting brackets, and fasteners.
b. Slats: Nominal 1" wide by 0.008" thickness before finishing heat treated and spring tempered aluminum; using reprocessed aluminum is prohibited.
c. Headrail size, nominal: 1" by 1".
d. Construction: Manufacturer's standard aluminum and steel components with synthetic fiber ladders and lift cords.
e. Tilt operation Manufacturer's standard wand tilter; wand bottom 4'-0", maximum, above finish floor.
f. Finish: Manufacturer's standard factory finish on metal components.
g. Colors: To be selected from manufacturers standard colors.
h. Hardware: Manufacturer's standard brackets, supports, and internal reinforcement.

2.2 FABRICATION

A. Shop assembly:

1. Verify actual opening dimensions by jobsite measurements.
2. Fabricate units for openings indicated, from head to sill and jamb to jamb in accord with reviewed shop drawings.
3. Provide 180% slat operation; tilt operation controls on left-hand side of units.
4. Units: Full height raising operation with locking at any point; pull cords on right-hand side of units.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Install blinds in accord with manufacturer's printed installation instructions.
2. Provide intermediate support for blinds greater than 4'-0" in length.
3. Adjust operating mechanisms for operation. Clean exposed surfaces not more than 48 hours prior to Date of Substantial Completion.

END OF SECTION 12491

SECTION 12494

ROLLER SHADES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Manually operated sunscreen roller shades.

1.2 RELATED SECTIONS

A. Section 06100 - Rough Carpentry: Wood blocking and grounds for mounting roller shades and accessories.

B. Section 09260 - Gypsum Board Assemblies: Coordination with gypsum board assemblies for installation of shade pockets, closures and related accessories.

C. Section 09510 - Acoustical Ceilings: Coordination with acoustical ceiling systems for installation of shade pockets, closures and related accessories.

1.3 REFERENCES

A. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

B. NFPA 701-99 - Fire Tests for Flame-Resistant Textiles and Films.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Styles, material descriptions, dimensions of individual components, profiles, features, finishes and operating instructions.
3. Storage and handling requirements and recommendations.
4. Mounting details and installation methods.

C. Shop Drawings: Plans, elevations, sections, product details, installation details, operational clearances, wiring diagrams and relationship to adjacent work.

1. Prepare shop drawings on Autocad or Microstation format using base sheets provided electronically by the Architect.

D. Window Treatment Schedule: For all roller shades. Use same room designations as indicated on the Drawings and include opening sizes and key to typical mounting details.

E. Selection Samples: For each finish product specified, one set of shade cloth options and aluminum finish color samples representing manufacturer's full range of available colors and patterns.

F. Verification Samples: For each finish product specified, one complete set of shade components, unassembled, demonstrating compliance with specified requirements. Shadecloth sample and aluminum finish sample as selected. Mark face of material to indicate interior faces.

G. Maintenance Data: Methods for maintaining roller shades, precautions regarding cleaning materials and methods, instructions for operating hardware and controls.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Obtain roller shades through one source from a single manufacturer with a minimum of twenty years experience in manufacturing products comparable to those specified in this section.

B. Installer Qualifications: Installer trained and certified by the manufacturer with a minimum of ten years experience in installing products comparable to those specified in this section.

C. Fire-Test-Response Characteristics: Passes NFPA 701-99 small and large-scale vertical burn. Materials tested shall be identical to products proposed for use.

D. Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC 9644, ATCC9645.

E. Mock-Up: Provide a mock-up (manual shades only) of one roller shade assembly for evaluation of mounting, appearance and accessories.
1. Locate mock-up in window designated by Architect.
2. Do not proceed with remaining work until, mock-up is accepted by Architect.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in factory-labeled packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same room designations indicated on Drawings and in the Window Treatment Schedule.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Install roller shades after finish work including painting is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.8 WARRANTY

A. Roller Shade Hardware, Chain and Shadecloth: Manufacturer's standard non-depreciating twenty-five year limited warranty.

B. Roller Shade Installation: One year from date of Substantial Completion, not including scaffolding, lifts or other means to reach inaccessible areas.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: MechoShade Systems, Inc.; 42-03 35th Street, Long Island City, NY 11101. ASD. Tel: (718) 729-2020. Fax: (718) 729-2941. Email: info@mechoshade.com www.mechoshade.com

B. Substitutions: Refer to Section 01 630 Products and Substitutions.

2.2 APPLICATIONS/SCOPE

A. Roller Shade Schedule:
   1. Shade Type 1: Manual operating, chain drive, sunscreen roller shades in all exterior windows of rooms and spaces shown on the Drawings.

2.3 SHADE CLOTH

A. Visually Transparent Single-Fabric Shadecloth: MechoShade Systems, Inc., ThermoVeil group, single thickness non-raveling 0.030-inch (0.762 mm) thick vinyl fabric, woven from 0.018-inch (0.457 mm) diameter extruded vinyl yarn comprising of 21 percent polyester and 79 percent reinforced vinyl, in colors selected from manufacturer's available range.
   1. Open Linear Weave: "1800 series", 15 percent open, linear-weave pattern.
   2. Color: Selected from manufacturer's standard colors.

2.4 SHADE FABRICATION

A. Fabricate units to completely fill existing openings from head to sill and jamb-to-jamb, unless specifically indicated otherwise.

B. Fabricate shadecloth to hang flat without buckling or distortion. Fabricate with heat-sealed trimmed edges to hang straight without curling or raveling. Fabricate unguided shadecloth to roll true and straight without shifting sideways more than 1/8 inch (3.18 mm) in either direction per 8 feet (2438 mm) of shade height due to warp distortion or weave design. Fabricate hem as follows:
   1. Bottom hem weights.
   2. Concealed hemtube.

C. Provide battens in standard shades as required to assure proper tracking and uniform rolling of the shadebands. Contractor shall be responsible for assuring the width-to-height (W:H) ratios shall not exceed manufacturer's standards or, in absence of such standards, shall be responsible for establishing appropriate standards to assure proper tracking and rolling of the

shadecloth within specified standards. Battens shall be roll-formed stainless steel or tempered steel, as required.

2.5 COMPONENTS

A. Access and Material Requirements:
   1. Provide shade hardware allowing for the removal of shade roller tube from brackets without removing hardware from opening and without requiring end or center supports to be removed.
   2. Provide shade hardware that allows for removal and re-mounting of the shade bands without having to remove the shade tube, drive or operating support brackets.
   3. Use only Delrin engineered plastics by DuPont for all plastic components of shade hardware. Styrene based plastics, and /or polyester, or reinforced polyester will not be acceptable.

B. Manual Operated Chain Drive Hardware and Brackets:
   1. Provide for universal, regular and offset drive capacity, allowing drive chain to fall at front, rear or non-offset for all shade drive end brackets. Universal offset shall be adjustable for future change.
   2. Provide hardware capable for installation of a removable fascia, for both regular and/or reverse roll, which shall be installed without exposed fastening devices of any kind.
   3. Provide shade hardware system that allows for removable regular and/or reverse roll fascias to be mounted continuously across two or more shade bands without requiring exposed fasteners of any kind.
   4. Provide shade hardware system that allows for operation of multiple shade bands (multi-banded shades) by a single chain operator, subject to manufacturer's design criteria. Connectors shall be offset to assure alignment from the first to the last shade band.
   5. Provide shade hardware system that allows multi-banded manually operated shades to be capable of smooth operation when the axis is offset a maximum of 6 degrees on each side of the plane perpendicular to the radial line of the curve, for a 12 degrees total offset.
   6. Provide positive mechanical engagement of drive mechanism to shade roller tube. Friction fit connectors for drive mechanism connection to shade roller tube are not acceptable
   7. Provide shade hardware constructed of minimum 1/8-inch (3.18 mm) thick plated steel or heavier as required to support 150 percent of the full weight of each shade.
   8. Drive Bracket / Brake Assembly:
      a. MechoShade Drive Bracket model M5 shall be fully integrated with all MechoShade accessories, including, but not limited to: SnapLoc fascia, room darkening side / sill channels, center supports and connectors for multi-banded shades.
      b. M5 drive sprocket and brake assembly shall rotate and be supported on a welded 3/8 inch (9.525 mm) steel pin.

c. The brake shall be an over -unning clutch design which disengages to 90 percent during the raising and lowering of a shade. The brake shall withstand a pull force of 50 lbs. (22 kg) in the stopped position.
d. The braking mechanism shall be applied to an oil-impregnated hub on to which the brake system is mounted. The oil impregnated hub design includes an articulated brake assembly, which assures a smooth, non-jerky operation in raising and lowering the shades. The assembly shall be permanently lubricated. Products that require externally applied lubrication and or not permanently lubricated are not acceptable.
e. The entire M5 assembly shall be fully mounted on the steel support bracket, and fully independent of the shade tube assembly, which may be removed and reinstalled without effecting the roller shade limit adjustments.

C. Drive Chain: #10 qualified stainless steel chain rated to 90 lb. (41 kg) minimum breaking strength. Nickel plate chain shall not be accepted.

2.6 ACCESSORIES

A. Fascia:
1. Continuous removable extruded aluminum fascia that attaches to shade mounting brackets without the use of adhesives, magnetic strips, or exposed fasteners.
2. Fascia shall be able to be installed across two or more shade bands in one piece.
3. Fascia shall fully conceal brackets, shade roller and fabric on the tube.
4. Provide bracket / fascia end caps where mounting conditions expose outside of roller shade brackets.
5. Notching of Fascia for manual chain shall not be acceptable.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install roller shades level, plumb, square, and true according to manufacturer's written instructions, and located so shade band is not closer than 2 inches (50 mm) to interior face of glass. Allow proper clearances for window operation hardware.

B. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

C. Clean roller shade surfaces after installation, according to manufacturer's written instructions.

D. Engage Installer to train Owner's maintenance personnel to adjust, operate and maintain roller shade systems.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 12 494

TABLE OF CONTENTS

DIVISION 2 SITE CONSTRUCTION

DIVISION 3 CONCRETE

DIVISION 4 MASONRY

DIVISION 5 METALS

DIVISION 6 WOOD AND PLASTICS

DIVISION 7 THERMAL AND MOISTURE PROTECTION

DIVISION 8 DOORS AND WINDOWS

DIVISION 9 FINISHES

DIVISION 10 SPECIALTIES

END OF TABLE OF CONTENTS

SECTION 15010

MECHANICAL GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 INTERPRETATION OF SPECIFICATIONS:

A. General provisions and requirements apply throughout. Cross-references or general provisions may be repeated for convenience or emphasis only.

B. Interpret the following as indicated:

1. "or equal": "in accordance with the General Conditions", or "an equivalent with respect to style and function."
2. "approved": "approved or accepted by Governing Officials or the authorities having jurisdiction".
3. "provide": "furnish and install, connect, and test, and contract for the performance of same."
4. "wiring": "required conductors or cable and raceway system, including fittings, boxes, connectors, supports, hardware, labeling, and miscellaneous related accessories."
5. "work": "materials completely provided," which shall include all activities and services necessary to meet contract requirements, including inspection and replacement as specified of any defective element."
6. "materials": "equipment and/or materials."
7. ": " : "shall be/have" Specifications following a colon are criteria which apply to the term preceding the colon.

1.2 SUBSTITUTIONS:

A. Utilize only those materials specifically listed by the Contract Documents. Substitutions of alternative types of major materials will not be acceptable unless a written "prior" acceptance is obtained. Requests for prior acceptance of alternative materials must conform to the procedures for submitting shop drawings and product data.

B. The design and layout shown on the plans are based on the manufacturer indicated on the equipment schedule. If equipment other than that used as the basis of design is submitted for use on this project, it shall be the responsibility of the Contractor to submit a revised drawing of the layout, showing the location, clearances for access and service. Changes to architectural, structural, electrical, mechanical, ductwork, or plumbing systems shall be the responsibility of the contractor, including costs for redesign of these systems. Submittals shall clearly indicate any required changes to the building systems affected by substitution of equipment.

1.3 GENERAL SCOPE OF WORK:

A. The Contract Documents establish the basic systems designs and the detail design of the work, or establish systems or materials performance criteria and minimum design requirements. In either case, certain aspects of the work or of the detail design are not established completely. Establish said work and details in accordance with industry norms and practice to suit the needs of the job. The work shall provide for complete systems and

services unless otherwise specified herein.

B. Division 15 will be responsible to carry out the commissioning requirements specified in Section 15995, 17100 and other sections referenced in 17100.

C. The work covered by this specification shall include furnishing supervision, labor, supplies, materials, equipment, tools, services, taxes and dollar costs required to construct and install the complete mechanical systems as specified herein and as shown by the plans and other relevant documents. Without limiting the generality thereof, the major items of the work are:
1. Utility connections and metering, including temporary connections.
2. Heating, Ventilation, and Air Conditioning system.
3. Plumbing system, including potable water and sanitary sewer.
4. Gas piping system.
5. Fire protection sprinkler system.
6. Control systems and wiring for systems provided.
7. Specialty systems as specified or shown by plans.
8. Special tools for maintenance or inspection of materials.
9. Necessary services and support work, including scaffolding, and hoisting.
10. Permits, inspection fees, approvals, licenses, registrations, certificates, taxes, and specified or miscellaneous dollar costs.
11. Shop Drawings and Product Data Submittals as specified.
12. Inspections, tests, and systems and equipment demonstrations.
13. Documentation and notifications.
14. Materials transportation, delivery, handling, storage, protection, guarding and inspecting.
15. Instruction of Owner's Operating and Maintenance Personnel.
16. Temporary utility and site distribution system(s).
17. Demonstration of completion of the work.
18. Replacement of Defective Work.

1.04 CODES AND STANDARDS:

A. The mechanical installation, equipment, materials and workmanship shall as a minimum is in accordance with the requirements and recommendations of the latest edition of the following:
1. International Building Code.
2. International Plumbing Code (Georgia Amendments).
3. Heating, Ventilation and Air Conditioning:
   International Mechanical Code (Georgia Amendments)
   The Georgia State Energy Code for Buildings
   NFPA 90A and NFPA 96
4. Gas installation:
   International Gas Code,(Georgia Amendments)
   AGA and NFPA standards
   Regulations of the Gas Company.
5. The fire protection system: NFPA 13.
6. Applicable federal, state, and local laws, codes, ordinances, and rulings of Governing Officials having jurisdiction.
7. Utility and service company regulations and requirements.
8. All equipment and materials shall be mounted and braced as required for Seismic Zone 2 requirements.

B. Codes and standards cited establish only the minimum requirements for the work. Where

requirements of the Contract Documents exceed requirements of the Codes and Standards, provide the work in accordance with the express requirements of the Contract Documents. Do not reduce the quality of the design or eliminate future capacity or options without acceptance by the Engineer, even if proposed changes meet minimum Code requirements.

C. The latest edition of the specifications, standards, and listings of the following organization are made a part of this specification. Mechanical work, unless otherwise indicated, shall comply with their requirements and recommendations wherever applicable:
   1. Underwriter's Laboratories, Inc. (UL)
   2. National Fire Protection Association (NFPA)
   3. American National Standards Institute (ANSI)
   4. American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE)
   5. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

1.5 COMPLIANCE OF WORK WITH CODES AND ORDINANCES:

A. Comply with the requirements of local ordinances and Codes as modified and amended by Governing Officials having jurisdiction.

B. Notify the Architect in writing of any instance where any requirement of the Contract Documents is in conflict with any Code or ordinance, so that any required changes may be made in a timely manner and without the need for remedial work. Do not perform work contrary to Codes, ordinances, regulations, or rulings of Governing Officials.

1.6 RELATED WORK IN OTHER DIVISIONS:

A. The following work is generally specified by other Divisions of specifications:
   1. Temporary water supply and temporary sanitary convenience.
   2. Fire extinguisher and fire extinguisher cabinets.
   3. Toilet accessories.
   4. Foundation drain tile.
   5. Catch basins or manholes.
   6. Installation of building access panels and plaster frames.
   7. Flashing and Pitch pockets for roof mounted equipment.
   8. Roof openings and outside wall openings.
   9. Cutting and patching of structural elements, walls, floors, ceilings, or roof.
   10. Structural platforms.
   11. Louvers and screens.
   12. Building access panels.
   13. Painting.

B. Electrical power work is covered by Division 16 specifications, including the following:
   1. Installation of individually mounted motor starters, controllers (starters), contactors, and related power wiring.
   2. Power wiring of motors, heaters, fans, etc. and furnishing, installation and wiring of individually mounted safety switches.

C. Refer to the General Conditions for requirements for submittals, training, and guarantees.

1.7 PERMITS AND COSTS:

A. Obtain and pay for permits, assessments, taxes, fees, licenses, etc. necessary for the installation of the work. Deliver to the Owner all such certificates of inspection or occupancy

issued by Governing Officials.

1.8 SHOP DRAWINGS AND PRODUCT DATA:

A. Submittals:
1. Fully in accordance with and consistent with the General Conditions, and with the requirements of the technical specifications and plans.
2. Include catalog cuts, bulletins, plates, drawings, diagrams, schedules, and any other information as necessary to indicate the relative characteristics, ratings, and capacities of the respective items of equipment.
3. Clearly and fully state any technical exceptions in one place.
4. Check for accuracy and coordinate between the involved trades before submission for review and acceptance by the Engineer.
5. Check electrical service for any equipment requiring power to ensure that equipment submitted matches the power systems for the project, including voltage and phase.

B. Shop Drawings:
1. Prepare shop drawings, of a scale not less than that of the contract plans, giving locations for major equipment, ductwork, and piping, based on equipment to be installed.
2. Show the location and weight of each item of roof mounted equipment, roof openings, pads, sleeves, anchor bolts, etc.,
3. Show all clearances recommended by the manufacturer for the service or removal of equipment/ materials.
4. Notify the Architect in writing where shop drawings indicate elevations of piping or ducts, which would place pipe, or duct below lighting fixtures or ceilings, or that would require the lowering of lighting fixtures or ceilings.
5. Coordinate the structural, architectural and systems changes required for the mechanical equipment actually used on the project.
6. Submit sheet metal shop drawings, based on field measurements of actual conditions and the equipment submitted and approved for this project. Sheet metal shop drawings shall clearly indicate all changes required to accommodate actual field conditions such as interference with structural or other building elements and systems.

C. Each shop drawing, product data sheet, catalog cut, etc. submitted shall bear on its face an acceptance date and signature of the Contractor, indicating that the submission has been checked and accepted for installation by the Contractor.

D. The Engineer's review of shop drawings and product data shall not change the requirements of the contract documents, nor shall this review relieve the Contractor of full responsibility for any and all errors or omissions in said documentation.

E. Submit shop drawings and product data for review for major systems and materials, including:
- Cleanouts
- Domestic Water Heaters
- Grease Traps
- Floor and Roof Drains
- Plumbing Fixtures and Accessories
- Plumbing Specialties
- Wall Hydrants
- Fire Protection System Layout (at same scale as the mechanical floor plans)
- Sprinkler Heads

- Fire Protection System Appurtenances (compressors, valves, etc.)
- Air Distribution Products and Accessories
- Air Conditioning and Heating Units with coil, fan, filter, and compressor data
- Condensing Units
- Dampers
- Duct Furnaces
- Duct Lining
- Ductwork and accessories
- Electric Heating Units
- Electric Heating Coils
- Equipment Layout Drawings
- Fans (with curves for fans 1/2 HP and larger)
- Fan Coil Units
- Flexible Ductwork
- Insulation (duct and pipe)
- Louvers and Screens
- Motor Controls
- Refrigerant Piping Diagrams
- Refrigerant Piping Specialties
- Sheet Metal Work
- Temperature Control System including control diagrams, control panel layouts, descriptions of operation and cuts of instruments
- Valves and piping specialties
- Variable Volume Devices

1.9 DOCUMENTATION, MANUALS AND RECORD PLANS:

A. Prepare manuals containing certificates or letters of warranty or guarantee, operating and maintenance instructions and recommendations, test results, and other data specified herein, and deliver the manuals to the Owner's Representative upon completion of the work. These manuals shall include information on major materials (such as major equipment) and on special systems or materials. Any special tools required for service or repair shall be listed.

B. Manuals:
1. Ring binders with the name of the manual, project, Architect, Engineer and Contractor placed on the cover of each manual.
2. Each manual shall contain a table of contents listing the items contained therein by number and name. Each item shall be properly indexed with a standard metal reinforced cover page tab, with item number and name printed on tab per se.

C. Provide Installation, Operation, and Maintenance (IOM) Manuals for major materials (equipment) in separate manuals, or sets of manuals, for each major system or item of material. IOM Manuals shall contain the following items of information:
1. Manufacturer's maintenance and operation recommendations.
2. Final (corrected) shop drawings and product data information.
3. As-built control diagrams.
4. Step-by-step starting and stopping procedures for each major item of equipment and related system.
5. Service telephone number of any installing Equipment Supplier or Manufacturer.
6. Executed Guarantee/ Warranty Cards and related beginning and ending period dates for each item of material/equipment.

D. Make written certification to the Architect that tests, checks, verifications, and settings have been satisfactorily completed. Where any item cannot be certified as correct, make a written report of the relevant facts and test data.

E. Have bonds, guarantees, receipts, affidavits, etc., called for in the various specification articles prepared and signed in advance of final demonstration of completion and acceptance of the work. Deliver to the Architect at or before the time of inspection with a letter of transmittal, listing each item included.

F. On a set of contract documents, maintain an accurate record of all deviations made during the progress of the work from the contract documents (plans and specifications). Also, maintain an accurate as-built record of the dimensional locations of outside underground materials such as meters, valves, and incoming utility lines, piping, or conduits. The marked-up (record) documents shall be available on the site for inspection during normal working hours.

1.10 SCHEDULING AND CONDUCT OF THE WORK:

A. Perform work on schedule and in a manner as described by the Special Conditions of the Specifications and by Division 15 specifications. Plan, coordinate, and execute the work to meet building schedules and so as not to produce interference between the work of the various trades, or with any special job site construction.

B. Specified tests may be witnessed by the Architect or Engineer, at their option. Provide at least five (5) days notice to the Architect of each test schedule, so that the Architect and Engineer may plan to attend the test if desired.

C. The Architect or Engineer may inspect the site at any time, at their option. In order that they may plan to inspect the job after the installation of major materials and before the materials are enclosed from ready view, notify Architect at least five (5) days in advance of the following construction milestones:
* Underground piping installed, but prior to slab being placed or trenches backfilled.
* Ductwork or piping installed, but before installation of walls or dropped ceilings, and before application of any insulation.

1.11 TRANSPORTATION AND DELIVERY:

A. Provide and pay for the transportation, storage and handling of materials. Materials shall be delivered to the job site in ample quantities to provide for the uninterrupted progress of work as scheduled. Where necessary, provide expedited or special shipping or handling of materials to prevent interruption of the overall job progress.

1.12 SPECIALIZED SERVICES:

A. Provide any necessary specialized services, such as accredited direct factory representative, as may be required for survey, inspection, supervision, installation, calibration, test, placing of equipment into operation, or for trouble shooting during the period of replacement of defective work.

B. Provide for the installation of control systems and related low voltage (generally 50 volts or less) wiring for the building systems covered by Division 15 specifications. Control systems and wiring shall meet the requirements of Division 16 specifications.

1.13 GUARANTEES / WARRANTIES:

A. Leave the entire mechanical system installed under this contract in proper working order. Replace any work or material, which develops defects, except from ordinary wear and tear, within one (1) year from the date of beneficial acceptance by the Owner.

B. Air Conditioning Compressors: a one (1) year manufacturer's guarantee against defective parts and labor, and an additional four (4) year manufacturer's guarantee on the compressor for replacement of parts only. For these compressors, the period for replacement by the Contractor of defective work shall be extended an additional four (4) years for services related to securing parts only.

C. The materials of the mechanical systems shall have the manufacturer's and/or supplier's guarantee or warranty put into effect by execution and filing of any and all related papers. For one (1) year from the date of acceptance, obtain service or repair under the terms of any said guarantee or warranty in the Owner's behalf.

PART 2 PRODUCTS

2.1 MATERIALS:

A. Equipment and materials: new, of the best quality and grade of the relative quality established, of manufacturer's standard, established product line. Where applicable standards are established, shall conform to National Board of Fire Underwriter's requirements and bear the seal of approval of a recognized and approved testing agency, as accepted by the Engineer.

B. Consistently maintain a product line throughout the entire installation.

C. Equipment and components that interact to form equipment assemblies and/or systems shall be of the same manufacturer to the greatest extent possible.

2.2 BUILDING ACCESS PANELS:

A. Building access panels:
   1. Metal construction with hinged door and an inconspicuous frame
   2. Size required to provide proper access for maintenance and service, with a minimum size of 18 X 18-inches.
   3. "B" label where installed in rated walls.

B. Milcor "DW", or equal, for drywall locations and Milcor "K", or equal, elsewhere.

2.3 PAINT:

A. Paint used for touching up factory painted apparatus shall be top quality and selected to match the factory finish.

B. Cold galvanizing compound: Sherwin-Williams "Zinc-Clad Primer" or equal.

C. Rust Preventative paint: "Rust-Oleum" or equal.

2.4 MOTOR CONTROLLERS AND ACCESSORIES:

A. Provide motor controllers for all motors specified under Division 15.

B. Motor controllers: General Electric, Allen Bradley Co., Allis-Chalmers Manufacturing Co., Westinghouse Electric Corp., or Cutler-Hammer.

C. Motors 1/2 H.P. and larger: Full voltage magnetic starters with three (3) overloads shall be in combination with a properly sized three (3) pole molded-case circuit breaker, and 120 V. control transformer with fused primary leads and hot secondary lead, all in a N.E.M.A. 1 enclosure unless installed exposed to weather, then N.E.M.A. 3R enclosure. Furnish auxiliary contacts and interlocks as required for control functions.

D. Motors 1/3 H.P. and smaller: Magnetic starters where required for automatic control, otherwise furnish manual starters. Where motors have built in thermal overload protection furnish contactors for automatically controlled motors and motor rated toggle switches for manually controlled motors.

E. Provide motor control accessories such as pilot lights, pushbuttons and selector (H-O-A) switches as a part of the apparatus, which they operate, located in the starter cover. Automatically controlled equipment shall be furnished with a "Hand-Off-Auto" switch and pilot light; manually controlled equipment shall be furnished with "On-Off" switch and pilot light.

F. Starters and electrical control devices other than those located in mechanical rooms, control panels, and storage rooms: flush mounted type with locking covers.

G. Nameplates:
1. Engraved laminated bakelite panel, secured with screws.
2. Provide a nameplate identifying the equipment served for starter, pushbutton station, and thermal overload switch.

2.5 ELECTRICAL MATERIALS:

A. Electrical materials: Division 16 specifications.

PART 3 EXECUTION

3.1 GENERAL DESIGN AND WORK:

A. Read and study relevant documents, including Codes. Become familiar with the site, the scope of work and services, type of general construction, and the civil, structural,

architectural, interior design, mechanical, electrical and special system plans and specifications.

B. Establish design and work details to provide for the complete installation of materials and the successful operation of systems. Notify the Engineer in writing, in a timely manner if responsibilities or directions are not clear, or if assistance is desired in determining the needs or requirements for any particular item.

3.2 INTERFERENCES AND COORDINATION:

A. The plans showing mechanical work are generally diagrammatic in nature. The plans shall not be scaled for any dimension.

B. Coordinate the work with that of different trades so that interferences between the mechanical work and other work will be avoided. Refer to building plans for guidance as to dimensions, finished grades, ceiling heights, door swings, room finishes, location of ducts, pipes, equipment, outlets and similar details that are required, and coordinate final installation with work as actually installed. Outlets and connections for equipment or devices to be installed by different trades shall be coordinated to assure that the outlets and connections are properly sized and located with respect to the equipment served and the surrounding areas.

C. Offsets and fittings in lines, and adjustments to equipment and fixture locations, as accepted by the Owner's representative, shall be provided to accomplish the work in a satisfactory manner.

D. If interference develops, the Owner's representative shall decide which item of equipment, ductwork, piping, conduit, etc. must be relocated, regardless of the sequence of installation of the affected items.

3.3 SPACE REQUIREMENTS:

A. Materials:
1. Fit into the space provided in the building or property.
2. Install at such time and in such manner as to avoid damage to the building structure or property
3. Install as required by the job progress.

B. Materials requiring normal servicing or maintenance shall be made easily accessible, including associated connection devices, wiring and/or piping.

C. Ductwork, piping, raceways, and supports
1. Maintain as close as possible to walls, floor slabs, columns, etc., so as to take up a minimum amount of space. Provide offsets and fittings required to accomplish this.
2. Do not be locate within 42-inches of switchboards, panelboards or motor control centers, including the space horizontally from the electrical equipment , and the space from floor to structural ceiling over electrical equipment.
3. Conceal in public or finished spaces.

3.4 WORKMANSHIP:

A. Workmanship:
   1. Of the highest quality.
   2. No substandard work will be accepted.
   3. Work shall be done by workmen skilled in the trade involved.

3.5 PROTECTION OF MATERIALS AND EQUIPMENT:

A. Protect materials from the elements and other causes of damage during shipment, storage, and erection, until final acceptance by the Owner.

B. During construction, cover the fronts of equipment to prevent marring or defacing.

C. Close open ends of ductwork, pipe, or conduit with temporary closures or plugged when work is stopped, to prevent debris from entering.

D. Install filters in air handling systems before any operation of the system. Exhaust fans may be protected using temporary filters cut from roll media and fastened over air inlets.

3.6 INSTALLATION OF MATERIALS:

A. Install materials
   1. In accordance with the manufacturer's published recommendations for installation
   2. In accordance with any listing restrictions of a certifying laboratory or agency
   3. In accordance with the requirements of involved Government Agencies or local Governing Officials.

B. Materials: set level, square and plumb, properly oriented, aligned and secured in the location indicated.

C. Lock washers: install under nuts, which bear on metal.

D. Surfaces to be painted shall be clean and free of dirt, dust, oil and rust.

E. Where galvanizing is broken during fabrication or installation (including tack welding), recoat exposed areas with cold galvanizing compound.

F. Paint exposed iron or steel materials such as ductwork, piping, conduits and supports (but not equipment, devices, and components), including those exterior to the building, where exposed to view without removing ceilings or access panels with one coat of rust inhibiting paint. The type and color of paint shall be acceptable to the Architect.

G. Paint materials and supports above ceilings, but visible through grilles or diffusers, etc., flat black unless inappropriate due to listing restrictions or function.

3.7 BUILDING ACCESS PANELS:

A. Provide building access panels where required to provide access for service and maintenance for equipment, fans, heaters, ductwork, damper operators, valves, traps, instruments, etc., including associated connection devices, wiring and/or piping. In general, only one (1) access panel shall be provided for an item of equipment and associated connecting devices, wiring and/or piping. Where feasible one access panel may serve several items of equipment.

B. Coordinate access panel location and size with materials/ equipment served to allow for installation, operation, inspection and maintenance as necessary, including testing and recalibrating. Access panels for fire dampers and/or duct smoke detectors shall allow resetting of the dampers and/or detectors.

C. Access panels are not required for materials above lay-in (push-up) ceiling systems.

3.8 EQUIPMENT FOUNDATIONS:

A. Concrete foundations or bases as required shall be provided and coordinated with the job. Furnish anchor bolts and other accessories required for casting in concrete bases, and also furnish proper templates and dimensions for casting bases and setting of sleeves or anchor bolts, or for core drilling of necessary holes.

B. Equipment mounting pads (housekeeping pads) shall be reinforced and secured to the floor; equipment shall be secured to the pads. Pads shall be sized to suit the application, based on equipment outlines and mounting base dimensions. Necessary block-outs or hardware for connections, drain lines, bolts, etc. shall be provided to suit the application.

C. Each item of floor mounted mechanical equipment, including fans and pumps, shall be installed on a 6-inch high concrete pad.

3.9 SUPPORTING DEVICES AND MATERIALS:

A. Provide supports for properly mounting materials. Supports shall provide adequate and rigid mounting for materials. Supports shall be fabricated and installed in a neat and workmanlike manner, and care shall be taken that at no time shall any portion of the building structure be overloaded or weakened.

B. Unless otherwise indicated, select and size foundations, supports, and fasteners.

3.10 CUTTING AND PATCHING:

A. Coordinate with the various trades sufficiently ahead of the construction of any floor, wall, ceiling, roof, or other element, and identify openings, foundations, pads, curbs, and inserts that will be required for the work. Do not cut any structural member without having received written permission from the Architect.

3.11 CLEANING:

A. Clean equipment, fixtures, devices and other materials furnished or set in place. Remove plaster, paint, stickers, rust, stains, and other foreign matter or discoloration. Surfaces shall be polished and free of paint, oil, grease, and other dirt and debris. Touch up or refinish materials, which have been damaged or marred during the construction process.

3.12 LUBRICATION:

A. After installation of equipment, motors and equipment components, lubricate as recommended by the manufacturer.

3.13 MARKING AND LABELING:

A. Provide marking and labeling for major items of equipment, controls, and materials.

B. Stencil air conditioning units and fans with system numbers in a prominent location using minimum size 2-inch high block letters.

3.14 CHECKS AND TESTS:

A. Make tests as reasonably required by the Engineer to prove the integrity of the work, and leave the complete installation in first class condition and ready for operation.

B. Thoroughly test and demonstrate individual systems to meet full functional requirements.

C. See other sections of the specifications for specific testing requirements.

END OF SECTION